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Health Management of Replacement Dairy Heifers

Introduction

Because a loss of 1 out of 5 calves can reduce a dairy producer's profits by nearly forty percent, it is important for the future of a dairy herd to raise healthy calves and replacement heifers.

A greater number of healthy replacement heifers gives the producer more choices when selecting replacement animals. This permits the dairy producer to raise the culling standards for the cow herd. In well managed dairy herds, a number of good quality replacement heifers may be available for sale and can be a significant source of income for the farm operation.

The disease triangle

An infectious disease occurs as a result of interactions among the infectious agent, the host animal and the environment. Usually factors that affect the calf's resistance or the calf's environment are the most important in determining if a disease will be present. The actual presence of an infectious agent is often not of major significance because it may also be found on farms that are not experiencing a disease problem. For this reason, when a disease outbreak occurs in a group of replacement animals, the predisposing factors as well as the specific infectious agent must be identified. Producers can have disappointing results with many vaccines when the predisposing management factors associated with a disease are not changed.

The incidence of most diseases affecting dairy replacements can be minimized by participating in a preventive health program offered by a veterinarian.

Where to begin?

Healthy replacement animals need a good start in life, that means the dam should be free of disease and in good body condition at calving. Ensure that all pregnant animals are fed balanced rations to avoid vitamin or mineral deficiencies that can cause weak newborn calves or calves which are more susceptible to disease. Vitamin A should be fed to dry stock at a rate of at least 50,000 IU per day, and a fortified trace mineral salt should be available free choice. Supplementation with selenium may be required if you are in a selenium deficient area. Vaccinations for infectious diseases which may be common in your area (e.g. IBR, BVD) should be up to date. Consult with a veterinarian for local vaccination recommendations.

The udder and vulva of animals due to calve should be washed before these animals are put in a clean dry calving area. A small pasture on high ground is ideal in the summer but during winter a well-bedded box stall or a corral with a well-bedded shed is a must. Avoid calving in the milking barn. Calves born in dirty, wet or crowded conditions or in a gutter are exposed to high levels of contamination. In this kind of situation a calf, may suckle the wrong cow and receive little or no colostrum.

If a calving problem develops, prompt assistance should be available to prevent the birth of a dead calf or a calf too weak to nurse properly.

Navel disinfection

Microorganisms can enter the blood stream through the navel of newborn animals and cause diseases such as pneumonia, scours and joint infections. It has often been recommended that the navel of a newborn calf be disinfected with 7 per cent tincture of iodine; however, there are few controlled trials to support this practice. Disinfecting the navel of a calf born in or kept in either wet or dirty surroundings is of limited value. Navel infections are common in calves born into these circumstances. It is more important that the calf be born and raised in a clean, dry environment.

Colostrum

Colostrum is a secretion obtained in the first six milkings after calving. It is high in antibodies that give the calf immunity (immunoglobulins) and vitamin A. It is essential that calves receive adequate amounts of good quality colostrum, to get the protection they need against infectious diseases, since calves are born with no immunity and are very susceptible to infections.

The ability to absorb immunoglobulins declines rapidly in the calf. At twelve hours after birth only half the immunoglobulins in the colostrum are absorbed into the blood stream and at 24 hours following birth little absorption occurs. Calves that do not receive and

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absorb adequate levels of immunoglobulins are more susceptible to neonatal calf scours, navel infections and pneumonia. These calves often have a poor rate of growth. If a calf has not nursed within two hours of birth, it should be force fed (with a nipple bottle or esophageal feeder) at least 5 lb colostrum per 100 lb birth weight. This should be repeated several hours later. Research has shown that calves absorb colostrum more efficiently, irrespective of how they receive the colostrum, when kept in contact with their dam rather than being separated. A calf should be left with its dam for 12 to 24 hours before it is removed to calf rearing facilities.

Emaciation

Calves can become emaciated or thin but are unrecognized as such because they are not physically handled. Usually these calves have been fed a poor quality milk replacer containing protein from a plant source or, they have been fed inadequate amounts of milk or milk replacer powder. The growth rate of affected calves is poor and many calves actually lose weight in the first four to six weeks of life. These calves are susceptible to pneumonia and other diseases. Diarrhea is often seen shortly before death. If emaciation is recognized, calves can make a dramatic recovery following a change to a whole milk diet.

Use a high quality milk replacer. Always follow the label directions when mixing milk replacer. A rule of thumb is to mix about one part of powder to seven parts warm water and feed this mixture at the rate of about 10 per cent of body weight divided into two daily feedings. Environmental conditions or temperature may require an increased amount of replacer to be fed to the calf.

Weaning

Depending on the amount of calf starter being consumed, weaning can successfully take place at four to eight weeks of age. Dehorning and removal of extra teats should be done before weaning or two weeks afterwards but not at the same time as weaning. Dehorning is easily accomplished using an electric dehorner. Dehorning paste can also give satisfactory results. Gougers or other methods of dehorning at an older age should be avoided, if possible, because of the stress and blood loss associated with this procedure. Remove extra teats using sharp scissors or a scalpel that has been disinfected before use on each calf. Disinfect the skin of the udder as well. Take care to remove the extra teats only. If in doubt, have them removed prior to calving at which time sutures will likely be required to facilitate healing.

Two weeks following weaning, calves should be grouped according to size with not more than six to eight calves per group. Watch for calves that may try to suckle others, and isolate the offender if necessary. Ensure that calves are grouped with other calves of similar age and size so that their nutritional requirements can be met. Make sure there is adequate ventilation and bedding. Remember to clean out bedding packs more frequently in warm barns. Remove calves from the barn while it is being cleaned.

Neonatal Diseases

About 75 per cent of deaths in calves under three months of age is associated with scours (diarrhea) or respiratory disease (e.g. pneumonia). Predisposing management factors are more important than the actual presence of the infectious organisms in outbreaks of these diseases. Calves that are well fed and kept in well ventilated housing are more resistant to disease. However, conditions that allow the proliferation or accumulation of a large number of disease organisms can overwhelm the calf's resistance, resulting in illness.

Neonatal calf scours

Calf scours are caused by a number of different bacteria, viruses and internal parasites, most of which may be present in low numbers in normal, healthy calves. The presence or absence of clinical disease is determined by predisposing management factors that affect the calf's resistance. These management factors include insufficient colostrum, birth in a dirty or contaminated environment, continuous use of a pen or calf barn, a damp environment, grouping calves of different ages, overcrowding, common or dirty feeding utensils and the use of poor quality milk replacers.

Newborn calves should be penned individually (without nose to nose contact) in a clean, dry environment until two weeks after weaning. The use of calf hutches has proven valuable in preventing outbreaks of neonatal calf scours, provided the hutches are moved, cleaned and disinfected between calves. Raised pens with slatted floors have also been used successfully for rearing calves, but the provision of a warm environment without drafts is important to avoid putting stress on the calf.

Use individual feeding utensils and make sure they are cleaned and disinfected following each feeding. Give whole milk to a calf at the rate of 8-10 per cent of birth weight (depending on the temperature) divided into two daily feedings until three weeks of age. Calves raised in hutches during cold weather need milk at the rate of 15 per cent of birth weight every day to have an adequate rate of gain. Before three weeks of age, calves may not do well on milk replacers. Use only high quality milk replacers containing no plant protein, fed according to recommendations, especially if fed to calves less than three weeks of age.

Fluids and electrolyte therapy are crucial for the

recovery of calves with scours. Consult with a veterinarian about early treatment of affected calves to minimize the losses associated with neonatal scours.

Respiratory disease

Respiratory diseases caused by viruses and bacteria occur frequently in housed dairy calves. Again, the resistance of the calf as well as its environmental conditions are much more important in determining the occurrence of disease than the actual presence of a pathogenic organism. Calves that have received or absorbed inadequate levels of antibodies (colostrum) at birth have been shown to be more susceptible to respiratory disease within the first two or three months of age than control calves. Deficiencies of vitamin A, selenium or protein are also associated with a higher incidence of pneumonia. Overcrowded and damp or poorly ventilated barns result in a high incidence of calf pneumonia. Calves housed on manure packs that are only cleaned out sporadically are very susceptible to pneumonia. Outbreaks of pneumonia have occurred in groups of calves confined in a barn while it was being cleaned. Calves may be forced to breathe in high levels of ammonia and other gases that can damage the lining of the respiratory tract resulting in pneumonia.

To control calf pneumonia, calves must receive optimum levels of colostrum soon after birth, and the subsequent nutrition must be good. Calves must not be overcrowded. Following weaning, calves should be grouped in pens of six to eight animals allowing at least 20 to 25 square feet per calf. Calf barns must be well ventilated with a minimum of four air changes per hour in winter and up to 40 air changes per hour in summer when the weather is hot. Air intake is just as important as air exhaust and must be such as not to create drafts but still ensure adequate air circulation to all parts of the barn.

Hutches have been used successfully to control respiratory disease as well as neonatal scours. Isolating calves from each other as well as older cattle by using hutches will reduce the transmission of disease organisms. Hutches must be kept clean and dry.

Young calves may not respond well to vaccines because of interference by the maternal antibodies obtained from the colostrum. Vaccines may also give poor results if predisposing management factors, which lead to disease, are not controlled. If more than 10 per cent of your calves suffer from respiratory disease before the age of 10 months, the predisposing management factors must be identified and corrected.

Miscellaneous diseases

A deficiency of **selenium** is common in areas where the soil is low in selenium. Vitamin E deficiency is often seen when the ration consists of poor quality hay and straw or ensiled forages. Calves affected with a deficiency of selenium and/or vitamin E are more susceptible to infectious diseases because their immune system is depressed. Some affected calves will be weak and tire easily or die suddenly after exercise (white muscle disease). The response to injections of vitamin E and selenium is good. Prevention involves supplementing deficient feeds with vitamin E and/or selenium.

Although **pinkeye** usually affects pastured animals, it can affect housed calves especially if the barn is poorly ventilated and calves are kept on a manure pack. Noxious gases may cause damage to the lining of the nose and eyes making them more susceptible to infection with the causative bacteria *Moraxella bovis*. Overcrowding and poor fly control also predispose calves to pinkeye by increasing the spread of the infection between calves. Avoid rations deficient in vitamin A and ensure calves are not overcrowded. Adequate ventilation and good fly control are essential for housed calves. Fly control using pesticide eartags or back rubs will often reduce the incidence of pinkeye in pastured animals. Vaccines against pinkeye do not appear beneficial in all situations.

Lungworms are an occasional problem in pastured cattle. Pastures become contaminated with larvae from infected animals. As the population of infective larvae builds up over the summer in damp areas, clinical signs of coughing and loss of condition will be observed in affected animals. Treating cattle before putting them on pasture is one way to reduce the contamination of the pasture, but unfortunately the pasture can under certain conditions remain infected from the previous year, or may be infected from carrier wildlife. Treatment of the pasture is impractical.

Lead is the most common cause of cattle poisoning in Alberta. It is often associated with the consumption of the plates from used car batteries or by drinking used crankcase oil. Cattle should be fenced away from all dump sites and the pasture should always be checked before putting cattle onto it. In Alberta Agriculture's diagnostic veterinary laboratories a history of sudden death of animals with few or no clinical signs and no apparent access to lead is common. Following a diagnosis of lead poisoning, the source of lead is almost always found following a thorough search of the pasture or pen.

Management

A representative number of calves and replacement heifers should be measured with a tape around their chest and weighed monthly to monitor their rate of growth. Rations can then be adjusted accordingly.

Make sure all cattle have adequate body size and body condition score at calving. This will minimize calving difficulties and ensure optimum milk production following calving. The nutrient requirements of bred heifers are different than for mature dry cows. Dry cows are larger and usually get more than their share

of feed if confined with bred heifers. The result is that the dry cows are overconditioned and the heifers underconditioned at calving time, both of which are associated with calving difficulties.

Treatment for lice and warbles should be done in the fall before November 15. Depending on the degree of infestation with lice, a second treatment may be required two weeks later. Because lice are brought into the herd by carrier animals, herd additions should be isolated and treated prior to mixing with resident cattle.

If a free stall barn is used to house the lactating herd, it may be advisable to bring first calf heifers into the barn for a month or so before calving to allow them to become accustomed to the concrete floors and the free stalls. It is always advisable to feed grain or concentrates to heifers prior to calving (no more than 5 lb/day) and gradually change the roughage in their diet to the lactating ration. By doing this, heifers will avoid digestive upsets and the incidence of lameness and liver abscesses associated with feeding problems will be minimized.

Vaccination recommendations

No single vaccination program will apply to all farms. The disease pathogens, management techniques and environmental conditions are unique on each farm. Therefore, always consult with a veterinarian regarding vaccination recommendations. Remember that vaccines often will not be effective if predisposing or poor management practices are not corrected first. The following diseases are widespread and relatively common in Alberta and vaccines should be used as an aid in controlling them.

Blackleg is still a common disease in Alberta despite the fact that effective vaccines have been available for years. It is most often found in pastured cattle but can occur in confined cattle and has been seen in young calves housed in warm barns. Calves should be vaccinated at four to six months of age and receive at least one booster at around one year of age. In some areas of the province, more frequent revaccination may be necessary.

Infectious bovine rhinotracheitis (IBR) is a viral condition that is usually recognized in dairy herds by abortions. Replacement heifers should be vaccinated prior to breeding. The vaccinations should be at least three weeks apart and the booster injection should be at least three weeks prior to breeding. On some farms, IBR results in a respiratory disease and calves may have to be given their first vaccination between four to six months of age. Consult with a veterinarian on the kind of vaccine to use and the frequency of revaccination needed.

Bovine viral diarrhea (BVD) is another viral disease common in Alberta. It causes abortions and congenital defects in newborn calves. Some calves are infected prior to birth but are born normal and shed BVD virus to other animals. Prior to two years of age, these 'persistently infected' calves are very susceptible to developing a fatal form of BVD which is characterized by a watery diarrhea and lesions in the mouth and throat followed by death in 7 to 10 days. The only way to prevent infection of the fetus is to ensure that the dam is vaccinated before being bred. Two vaccinations three weeks apart are required before breeding, with the booster injection administered at least three weeks before breeding. Two kinds of vaccine are available at the present time. It is important to consult with a veterinarian before using these vaccines so that you understand the advantages as well as the dangers in using these products in your herd.

Vibriosis is a venereal disease of cattle. If heifers are to be bred using natural mating, consideration could be given to vaccinating them before hand against vibriosis. The disease is not common in central or northern Alberta. Consult with a veterinarian to determine the prevalence of vibriosis in your area.

Prepared by:
G.W. Ollis, D.V.M.
Health Management Branch

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